



Your File: MOE South Region Authorization # 107689

Our File: REF 16-010

24 November 2016

Upland Excavating Ltd.  
7295 Gold River Highway  
Campbell River, BC, V9H 1P1  
Email: [inquiries@uplandgroup.ca](mailto:inquiries@uplandgroup.ca)

**Attention: Upland Excavating Ltd**

**Re: City of Campbell River Comments, Final Technical Reports, UPLAND LANDFILL – NOTIFICATION OF APPLICATION FOR OPERATIONAL CERTIFICATE FOR SOLID, NON-HAZARDOUS WASTE LANDFILL; 7295 Gold River Highway**

***Proponent: Upland Excavating Ltd***

***Legal Description: Lot A, District Lot 85, Sayward District, Plan 30709 except part in Plan EPP15087***

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Thank you for providing the City with copies of your Final Technical Reports and for providing this second opportunity for stakeholder submissions. In addition to these reports, Staff also reviewed the report entitled *Review of Upland Excavating Landfill Application Technical Assessment Reporting* (Gilles Wendling, GW Solutions Inc., 17 Oct 2016).

The City appreciates the detailed responses to the City's questions (22 March 2016) provided in the Stakeholder Consultation Summary Report along with the answers to the other Stakeholder concerns. This resulted in a number of changes and clarifications to the Final Technical Reports. As noted in our previous letter, the City of Campbell River recognizes the need for a local solution to the local waste stream including contaminated soil and asbestos. At the same time, any proposed facility has the potential to have environmental impacts of concern and the City must feel confident that every precaution has been considered to avoid impacts to the community's drinking watershed as well as the Quinsam River, Cold Creek and other environmental receptors.

Follows is a list of additional comments and concerns for your consideration. These comments are grouped according to the specific reports provided by Upland Excavating Ltd. and the section number within the report. These comments and questions have been reviewed and endorsed by Council at the 23 November 2016 Committee of the Whole meeting.

Thank you also for meeting with staff on 10 November 2016 to review the GW Solutions report. We recognize that some of the questions that follow were answered during that meeting. However we have left these questions in the list to ensure that the answers to these questions become part of the file records and we would very much appreciate written responses.

### **Stakeholder Consultation Summary Report**

1. Council requested clarification on the relationship between the new *Water Sustainability Act* and the application of the Act to this project (14 April 2016). This information was not included in the Consultation Summary Report. Please clarify.
2. Council also requested a cross section showing McIvor Lake through Rico Lake and the Site that includes the depth of Rico Lake in order to determine subsurface drainage (14 April 2016). This request is not addressed in the consultation summary. Please address.
3. City Staff previously noted that should the proposal proceed, the development would trigger the City of Campbell River's Watershed Development Permit process and the submission of an Environmental Impact Assessment report that assesses risks and that defines and evaluates the cumulative effects of the landfill. Thank you for acknowledging that further discussion will occur on the development permit requirement subsequent to making an application under the Provincial Waste Discharge Regulation.
4. City Staff asked a question in relation to pre-landfilling baseline water quality "Since the site is already operating as a landfill, is it correct to call the baseline water quality "pre-landfilling" in the hydrology report? To what extent is the baseline water quality already impacted by past landfilling activity at the Site?" The answer in the consultation report notes that only ash is within the localized area above the pit wall. Does this mean that no leachate could be present in the various ground water samples collected from previous landfilling activities? Please clarify.

### **Technical Assessment Report**

1. General question- If for some reason the landfill is not pursued and an Operational Certificate is not obtained, what happens to the existing fill and potential leachate generated from this material?
2. 1.4.2 The last bullet references that draft reports be submitted to MoE for comment prior to the final application. Did MoE provide comments to Upland on the previous draft reports and if so, would these comments be available for City/public review?
3. 9.2.13 Quarterly groundwater sampling will not capture extreme events. How will extreme events be captured?

4. 10.3 Thank you very much for including a section on avoided greenhouse gas emissions by providing a local solution to the local waste stream. The Comox Valley Waste Management Centre in Cumberland is used as the alternative location in the calculation presented. Note however that this facility does have a system in place to capture landfill gas which may mean that 442 tonnesCO<sub>2</sub>e of avoided transportation emissions could be offset by the system to collect the gas generated once the material is landfilled.
5. 11.1 and 11.2 Can Upland confirm if MoE will make the proposed quarterly and annual reports available to the public?
6. 11 Which bullet(s) in the proposed monitoring program cover the geotechnical investigation recommendations regarding short term settlement, long term settlement and a slope stability contingency plan? These considerations should be specifically referenced so there is no confusion as to whether or not they are included in the monitoring program.

### **2016 Geotechnical Investigation**

1. 4.2 Please clarify the implication of the potential temporary saturation condition at the base of the east/northeast toes of the landfill caused by existence of the Gravel wash plant and a treated leachate infiltration pond.
2. 4.8 and 6 During the period of short term settlement, site reconnaissance by geotechnical professionals is recommended to identify locations of distress. What will the frequency of these inspections be and will the inspection results be included in the environmental management plan (EMP) quarterly or annual reporting described in the Technical Assessment Report? Similarly, will long term (primary consolidation) settlement repairs and creep (secondary consolidation) settlements be reported out on as part of the EMP? In relation to these issues, the conclusions section also recommends the development of a contingency plan as part of the continued use and closure design to address any sudden buildup of pore pressure in the landfill. Has this contingency plan been developed?
3. 6 In the conclusions it is identified that “The potential for settlement of the landfilled waste should be considered when conducting a detailed evaluation of the landfill cover system.” When will this recommendation be actioned?

### **Hydrogeology and Hydrology Characterization Report**

1. We are very concerned that the GW Solutions review has identified that “there is insufficient characterization of the groundwater regime across and near the Site.” The report goes on to note that when they used the data provided by GHD their interpretation of groundwater is that it moves in an east-northeast direction as opposed to southeast. What additional

- studies would be required to determine which interpretation is correct and over what time frame would these studies need to be conducted?
2. The GW Solutions report also notes that there is insufficient characterization of both the lithology and groundwater regime at and beyond the property boundary and insufficient information on the vertical and horizontal hydraulic gradients. What additional studies would be required and over what time frame would these studies need to be conducted to solve this issue?
  3. The GW Solution requests a complete picture of the hydrological regime of Rico Lake and the City concurs with this recommendation.
  4. Has consideration been given to the low flood control zone level of 172 m for Mclvor Lake in the BC Hydro Campbell River System Water Use Plan?
  5. 1.3 Future land use in the vicinity of the site may include private domestic wells. Could leachate potentially contaminate the aquifer for those wells?
  6. 3.4.2 States "...bedrock surface is variable at site." Could areas of the sand and gravel aquifer potentially extend northeast to Mclvor Lake?
  7. 3.4.2 States "There are insufficient monitoring points to accurately map the groundwater flow direction within the fractured bedrock unit." There is only one bedrock aquifer monitoring well. How can this situation be remedied? How many more monitoring points are required and what are the plans for following through with this recommendation? Could groundwater move from the Site to Mclvor Lake?
  8. 3.4.4 Notes that there are two water bearing perched aquifers identified in the southwest portion of the site and that these water bearing zones are not connected with the remaining ground water units at the site. Figure 3.6 does not show the flow of groundwater in this location. Please clarify the groundwater flow path for these perched aquifers, or if unknown, please describe what works need to be completed to determine the flow. Would additional down-gradient monitoring wells be required in this location to determine baseline water quality?
  9. 3.4.4 What is the water level at MW5A-15 during peak the precipitation period?
  10. 3.4.5; 4.2; 4.4 and 5 (recommendation section) The report recommends that a monitoring well be installed within the overburden sand and gravel aquifer near the down-gradient Site boundary (MW6-16) prior to landfill development to establish baseline water quality and to assess future water quality. What are the plans for following through with this recommendation? If the groundwater flows are not as interpreted (as GW suspects), MW6-16 may not be in the right location and additional monitoring wells may be required.
  11. 3.4.5 and 5 (recommendation section) The report recommends that "In order to further investigate the nature of this bedrock ridge and further validate the direction and magnitude of groundwater flow between the Site and Mclvor and Rico Lakes, an investigation of the

bedrock ridge and bedrock between Rico and Mclvor Lakes should be undertaken through installation of three bedrock groundwater monitoring wells.” What are the plans for following through with this recommendation?

12. Figure 3.2 indicates the potential that the final elevation of proposed fill material may create a groundwater divide that directs a portion of groundwater on site to the West. Please comment on the potential for this to occur and what the implications might be.
13. Figure 3.3 Is the high elevation of the proposed landfill 191 m AMSL?
14. Table 2.0 The water level at MW5B-15 on Jan 25, 2016 was 186.6 m AMSL. This is above even the maximum operating level of the Campbell Reservoir system. Could this lead to ground water flow towards Mclvor Lake? Please refer to BC Hydro (2012). Campbell River System Water Use Plan. Retrieved from:  
[https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning\\_regulatory/wup/vancouver\\_island/2012q4/campbell\\_river\\_WUP\\_accept\\_2012\\_11\\_21.pdf](https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning_regulatory/wup/vancouver_island/2012q4/campbell_river_WUP_accept_2012_11_21.pdf)
15. 4.0 Groundwater, residential, surface water, and wash plant samples collected to characterize baseline groundwater quality were restricted to the period Sept 2015 to Jan 2016. Please indicate why sampling has not covered a full year in order to determine seasonal variation in water quality?
16. 4.0 Since landfill is already occurring on the Site, is the sampling that is being conducted to determine baseline water quality potentially already being impacted by leachate?
17. 4.1 Currently, freshwater aquatic life standards will be applied to only the western boundary of the site. Would it be feasible to apply these guidelines to all of the site boundaries?
18. 4.2 Only selected parameters are used for baseline water quality data. MoE has set baseline waste quality objectives for Mclvor Lake including total zinc, copper, cadmium, and phosphorus. These should be included in baseline water quality data. Please reference the British Columbia Ministry of Environment (2012). Water Quality Assessment and Objectives for the John Hart Community Watershed and Mclvor Lake. Retrieved from:  
[http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-objectives/wqo\\_tech\\_john\\_hart\\_mcivor.pdf](http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-objectives/wqo_tech_john_hart_mcivor.pdf)
19. 4.2 Only surface water quality is discussed at Mclvor Lake and Rico Lake between September and October; please provide the number of samples taken at each – it appears that only two samples were taken. Given thermal stratification, the potential for groundwater infiltration subsurface, lake turnover and other potential characteristics of lakes that could cause wide variation of water chemistry at different depths and over seasons, please discuss how these restricted samples are adequate to determine baseline conditions.
20. 4.2 Is one sample from on-Site wash plant enough to adequately determine if the wash plant is a source of impact to overburden sand and gravel aquifer? How would the water quality at the wash plant be expected to vary over the year?

**2016 Design, Operations, and Closure Plan**

1. 2.1.2 What sources were referenced to determine drainage and watercourses features? Was the Sensitive Ecosystem Inventory referred to?
2. 2.1.2 Several ephemeral creeks with drainage to the Quinsam River are noted but their distances to the Site are not referenced. Please provide these distances and the source of this information.
3. 2.2.2.1 Can fractured bedrock seams exist that would allow groundwater flow to Mclvor Lake?
4. 2.2.2.1 Is the “interbedded silt” area subject to mass wasting?
5. 2.3.1.1 What is the static water elevation within Mclvor Lake? If Mclvor Lake fluctuates by about 1.5m, would the elevation differential still be great enough to support the interpretations as noted on page 7?
6. 2.3.2.2 The “expected” flow direction in the bedrock unit should be confirmed prior to any work on site.
7. 2.3.1.3 Is the groundwater level in the perched aquifer above Mclvor Lake level?
8. 3.1 There are two environmentally sensitive wetland swamps that exist to the south and southwest of the site. What is the distance to these sites? Please reference Environment Canada (2004). Sensitive Ecosystems Inventory of East Vancouver Island and Gulf Islands Disturbance Mapping and Re-evaluation of Major Riparian Corridors March 2004. [Map]. On map sheet 092F.094 the wetland swamps are S0477A\* and S0478 which can be found in the top left section of the map. Retrieve from:  
<http://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=2124>
9. 3.1 There are three bullets in the list related to the 100m buffer zone between the limit of refuse and an environmentally sensitive area, surface water and seasonal high water mark of an inland lake. In a similar fashion as the other bullets where these criteria cannot be met, a brief explanation or reference to another part of the document should be included.
10. 3.1 Landfill operation to be 1.5 m above groundwater. This should be above high groundwater level not static during dry season.
11. 3.6 The City is concerned by the Campbell River Environmental Committee’s comment that the “Nilex Civil Environmental Group provided a Chemical Compatibility Chart for the HDPE [base] liner [for the landfill]. Hydrocarbons and volatile organic compounds are not compatible to that liner, depending on their strength.” Please comment on this statement given that these materials are expected to be within the contaminated soil accepted at the site. What is the risk to the major sand and gravel overburden aquifer under the landfill which is identified in the BC Water Resource Atlas that the report identifies as being the main

- receptor to potential landfill-related groundwater quality impairments on page 6 of the document?
12. 6.1 Please verify if chromated copper arsenate (CCA)-treated wood will be accepted at the proposed landfill. Also, please clarify if aquaculture related waste will be accepted.
  13. 6.10 Can Upland include a copy of the open burn reports that are prepared and submitted to the Province in the annual Environmental Monitoring Report? In relation to the Upland proposal, the City received an email from the Provincial Air Quality Meteorologist encouraging the reduction of open burning given that fine particulate air pollution levels (PM2.5) at the Dogwood site in Campbell River exceeded the provincial objectives last year.
  14. 6.17 The Environmental Monitoring documents should be kept for longer than seven years. These records may be important in order to determine cumulative effects over time, especially if the landfill is extended beyond the current footprint at some point in the future. Please indicate if these records will be maintained.
  15. 6.8.1 How will Upland determine if the proposed dust control measures will adequately address the potential for volatile or dust born contaminants to be transported to nearby water bodies?
  16. 8.1 What is the plan to address an event where leachate or surface water that has come into contact with the waste, escapes to the surface water runoff from the watershed around the landfill? Are there any periodic water quality tests planned for the outflow locations of diverted water as a precautionary measure?
  17. 9.4 This section notes that use of chloride as an indicator parameter must be evaluated further based on the observed leachate quality given that levels are typically lower at a construction and demolition landfill. Further, hydrocarbons are expected to be a major contaminant, but the report notes that these are not good leachate indicators given that there are many processes that degrade them. Metals are also listed as major contaminant expected. Please indicate what sort of monitoring program would need to be in place in order that metals could be used as a leachate indicator.
  18. 9.8.1 The leachate treatment objective for the system is to meet the Schedule 6 Drinking Water standards as per the Contaminated Sites Regulation. How will this ensure that the Freshwater aquatic guidelines (which are stricter for certain parameters) are met at the west side of the site?
  19. 9.8.3.2 The batch leachate treatment cycle is identified as 7 days. How was the 7 day figure determined; are there other reports or sites with similar waste streams used as a reference to determine this turnover time? It is understood that with freeboard and batch cycles there is the ability to hold batches longer than 7 days if required. If it turns out that 7 days is consistently not long enough, at what point would a second aeration pond be required in

order to accommodate leachate generation? Please indicate on the site drawings where the additional aeration pond would go. Would an additional aeration pond also require an additional infiltration pond?

20. 9.8.3.3 and Table 9.1 While it is understood that the drinking water quality guidelines will be used for compliance monitoring at the site boundary and not at the aeration pond, it is still concerning that the forecasted maximum treated leachate concentrations remain at (or potentially above?) the Schedule 6 Drinking Water Guidelines for chloride, sulphide, arsenic, boron, chromium, iron, lead, manganese and sodium. It is unclear from the report how these exceedances will be managed other than through dilution with groundwater between the infiltration pond and the site boundary. Are the forecasted potential exceedances before or after chemical precipitation? Is there a risk that additional batch time and chemical precipitation won't be able to achieve the water quality guidelines? If this is a risk, what will be done with the leachate? If freshwater aquatic life guidelines are to be met on the West side of the site, shouldn't these parameters also be listed for comparison in Table 9.1?
21. 10.4.1 How many tonnes of waste does the site already have in place?
22. 10.5 As per the City's previous comments, please ensure that landfill gas is recognized as greenhouse gas that contributes to Climate Change, in addition to the immediate concerns of health and toxicity issues.
23. 10.6 The Stakeholder Consultation Summary Report notes in reply to a City question that "For Upland, the most appropriate [emission reduction approach] would be to consider the installation of passive biofilters as part of the Closure plan. If deemed appropriate the passive biofilters could reduce the lifecycle GHG emissions of the landfill." Section 10.6 does mention the evaluation of the biofilters but no further information is given. Please elaborate on how biofilters could help reduce greenhouse gas emissions.
24. 12.0 The parameters used for modelling the contaminating life span of the landfill include chloride and sulphate. Chromium, copper and cadmium were also considered but ruled out because the forecasted leachate concentrations are below applicable environmental protection guidelines. Why were the other parameters with potential forecasted exceedances in Table 9.1 not considered? Could arsenic be a potential parameter for consideration?
25. 13.3 Is there a solution for the expected potential drinking water quality guideline exceedance of manganese at the downgradient site boundary?

We look forward to receiving a written copy of responses to these questions.

Sincerely,



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Matt Rykers, B.Sc.  
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Reviewed and endorsed by:



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